Altina the Sword Princess

– Haken no Kouki Altina –

- Extra -

Volume 1-10 Appendices

– The World of Altina the Sword Princess –

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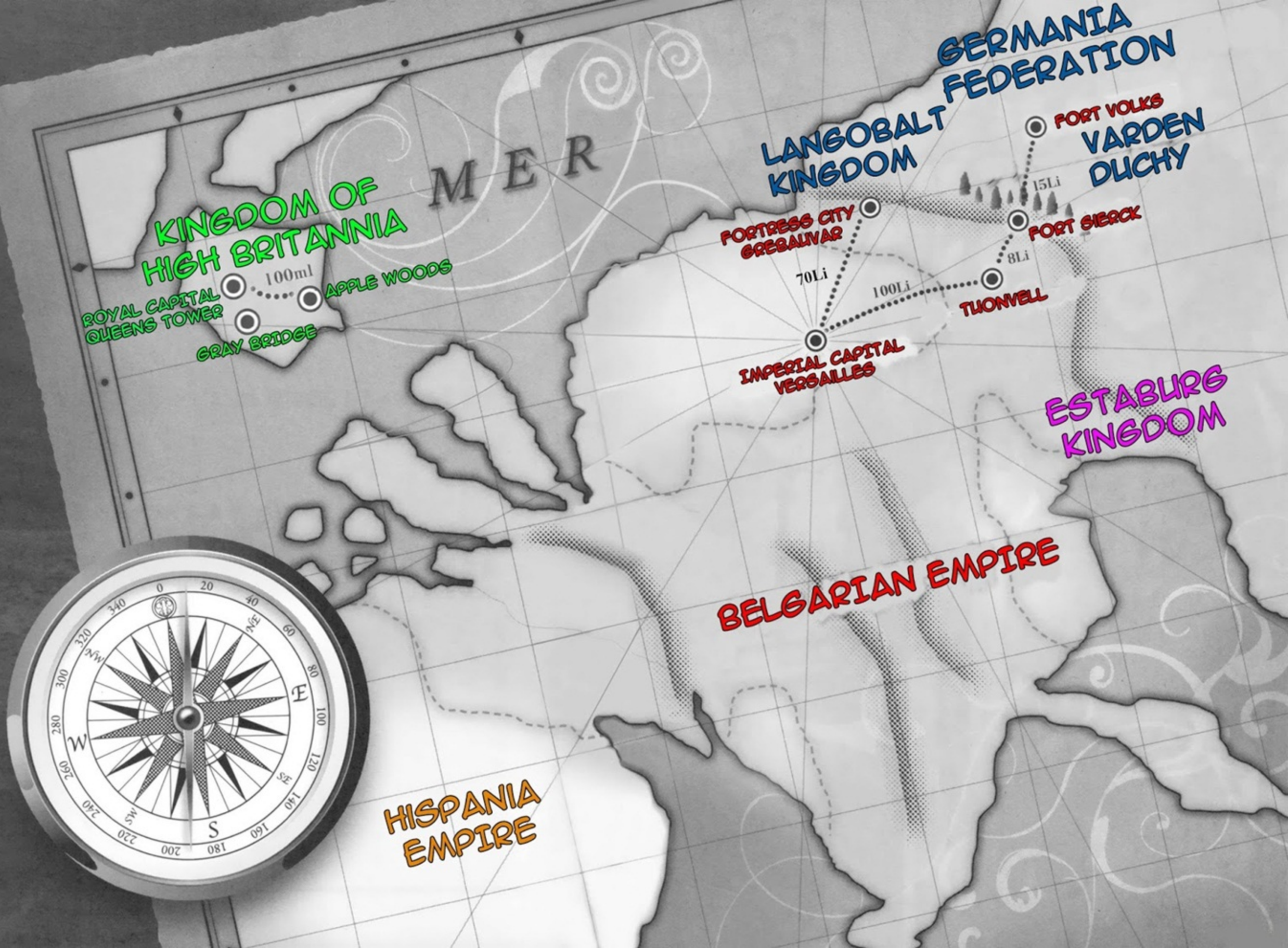
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HIGH BRITANNIA
ROYAL CAPITAL
QUEENS TOWER
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APPLE WOODS
GRAY BRIDGE
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GERMANIA
FEDERATION
FORTRESS CITY
GREBALIVAR
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15Li
FORT SIERCK
8Li
70Li
100Li
THONVELL
IMPERIAL CAPITAL
VERSAILLES
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KINGDOM
BELGARIAN EMPIRE
HISPANIA
EMPIRE

Currency

In the Imperial year 850, the Belgaria Empire only had three types of currency, the Livre gold coin, Sol silver coin and Denier bronze coin. There was no paper money.

The livre gold coin and denier bronze coin were about the size of the 10 yen coin circulating in Japan now, while the sol silver coin was as big as a 500 yen coin.

As for their value, it was 1 livre = 20 sol = 240 denier, but there were times when it gets messed up.

60 years ago, because a large amount of silver was obtained from the land they conquered, the price of silver fell drastically. It led to a serious currency crisis. In order to stabilize the market, the finance ministry restricted the flow of sol silver.

Shortly after that, machines were used to mint coins. This was because the restriction on silver coin meant the speed of minting bronze coins by hand could no longer keep up with market demands, so mechanization was implemented.

There were many failures at the start, but in this era, high quality coins with uniform weight and shape could be produced.

As for their purchasing power, 1 denier could buy one basket of apples (3-4) and one egg. Or one day's worth of bread, or one glass of beer.

The living expenses of a commoner was about 50 denier.

As the weekly wages of a labourer was 100 denier, it was possible to save money if one didn't splurge.

By the way, the weekly wages of Regis, a Fifth Grade Admin Officer, was 200 denier, an unexpectedly high remuneration, but he books he love cost 20 denier a copy. Even though it cost 200 denier at the borders, he would still purchase it.

There wasn't any insurance or social safety net in the Empire, so most people would save their money in case of future needs such as injury, illness or marriage.

There were those who send their wages back home too.

And so, the organization that took on the role of a bank was the church.

Spread across the entire nation be it the boondocks or frontlines, reliable enough to deposit savings and perform transactions and strong enough to stand up to the boorish ways of the aristocrats. In this era, only the church fulfil these criterias.

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Lighting

In this era, the Belgaria Empire uses four types of illumination tools.

The best was gaslamps, which was bright, steady and minimal smoke. However, the fuel was hard to obtain, and only a part of the Imperial capital uses it. For example, the halls of the palace.

Second best would be oil lamp, which was the most common in the Empire. Soaking the wick into a container filled with oil, that's how simple the design was. Not only could it illuminate the house, it was used by pedestrians and even the headlights of carriages, very widespread in usage.

Candles were dimer, the flame would flicker and it emit a lot of black smoke.

However, places that produce fuel for oil lamps were limited, and there was some risks in transporting it. Hence, some regions would normally use candles.

The Belgarian Empire used beeswax candles. The hives of bees were used as an ingredient, made by melting the hives in hot water to remove the impurities.

Common products would have more residue, and was yellowish brown in colour.

White candles without impurities were high class items, used to seal envelopes, make furniture and cosmetics. The ceremony in churches also used white candles.

On the battlefield, torches made by tying grass onto a stick, dipping it in oil and before lighting it on fire were used.

It was bright and the fire don't die easily, and a good point about it was that it would stay lit even when dropped onto the ground.

On the other hand, it emit too much black smoke and couldn't be used in the house, and there was the risk of sparks flying around, which might burn the house down.

Fire was lighted by using tinderbox.

Only well to do families could afford the lighting tools described above. Servants and the impoverished could only rely on the moonlight.

Electricity was still being researched by scientist, and the production of electricity has yet to reach a practical stage yet. It would be another hundred years before the debut of the light bulb.

Cannons

In Imperial year 851 of the Belgaria Empire, firearms such as pistols, muskets and cannons exist.

The cannons were the first to be implemented into the army, and was the the most influential in changing the face of war.

It's design was very simple, one side of the barrel was sealed in a conical shape. The inside was like a narrow cup.

First, a pouch of gunpowder were stuff in from the muzzle. An iron cannonball serving as projectile would be rammed in next.

If the pouch of gunpowder was ignited, there would be an explosion, and the pressure would make the cannonball fly out.

And so, how could the gunpowder be ignited? After all, it was deep inside the steel cast cannon, and covered by the iron ball and wrapped in a pouch.

In the depths of the cannon was a thin narrow hole called a vent, which was about the size of a finger. The vent pick, a ice pick like dagger, was struck down the vent and into the gunpowder pouch.

Next gunpowder was poured into the vent, and it could be ignited from the outside.

Although some of the pressure from the explosion would escape from this vent…

This method of ignition had never changed in almost 400 years.

The cannons might be powerful, but if the projectile was just an iron ball, it's area of effect would be quite narrow. Therefore, it was more prominent in sieges to destroy castle gates and walls, or in naval battle.

And after equipping a large quantity of it, it was very effective in city and fortress defense, which was an exception to its usage.

The munition used by the firearms in this era was black powder.

By using it could be easily made by mixing charcoal, sulphur and saltpeter. Furthermore, the fineness of the powder, temperature and humidity would all influence its power, and there were times when it would just burn instead.

An abnormal explosion might break the body of the cannon, or the projectile might shatter and block the barrel, or it might fail to fire due to a dud.

And many of the artillery soldiers weren't familiar with the operation of the cannons, so the rate of cannons breaking down were rather high.

By the way, in the Kingdom of High Britannia on the other side of the ocean, the 'Elswick cannon' that was breech loaded had been invented.

Even though it had a complicated design, it was powerful, long ranged and very accurate.

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Books

Before the invention of paper, books were written on thin slices of wood and animal skin. Ink was the charred remnants of burned oil, or crushed minerals dissolved in water.

When Belgaria was founded, basic papermaking technology was already widespread.

Back then, things like torn rags were used as the ingredient. The torn rags were cut into pieces, submerged into water, then stretched out slightly and tried.

Even with the advance in technology, the fundamentals of papermaking remained the same. It might become thinner, whiter and easier to mass produce, but the basic concept was the same.

If limited resources like torn rags were used, paper would not be able to be widespread.

The first person to invent a machine that uses vegetation as the ingredient to make paper was a scientist from the Germanian Federation. With ingredients that was much

easier to obtain, paper of a higher quality was made. This revolutionary invention spread out in the world immediately.

In the Belgaria Empire, producing paper at such a large scale happened in the Imperial Year 800. By order of Emperor Vicente, a large paper fabrication plant and print publishing factory was built in the suburbs of the capital.

Not only was cheap paper readily available, there was also a publisher right besides it, it was natural for book publishing technology to advance rapidly.

It wasn't just rolling paper into scrolls or folding them up, but binded books that used fine strongs and steel staples.

Thin books bound together by glue were also made.

Books bound by glue was basically the same as the book fabrication process used in modern Japan. But gluing one edge of the papers to create a spine, it could be secured firmly.

(I think that's how this book should be like, not that wouldn't be so for the digital version.)

By the way, Regis was an avid reader, but not a book lover or collector. He had a theory that 'the value of a book isn't decided by its rarity or workmanship, but its content'.

But at the same time, it was a fact that holding a rare and well made book in hand would make one feel happy.

Carriage

In Imperial year 851 of the Belgaria Empire, carriages were like a car in modern times, an irreplaceable mean of transporting people and cargo.

The horses that draw a carriage were called 'carriage horses', horses that were tough, strong and didn't tire easily would be treated like treasure.

For horses in the military, the most important thing was to let them get used to the sound of rifles and cannons, so they won't be spooked by them. Horses that had been specially trained in such a way were known as warhorses.

The horses rode by knights were required to be smart and brave, as well as its appearance such as built and colour. Excellent horses were more expensive than a house.

A carriage were categorized by the number of horses drawing it, the size of the luggage compartment, type of overhead cover and whether it had springs. Buggy, cabriolet, coupe, wagon and other such names of cars were originally used by carriages.

I will introduce the wagon (large carriage drawn by four horses) used by Princess Marie Quatre's group here.

It was the largest type of station wagon. The roof of the carriage was normal, but it prioritize safety and had a boxed shape passenger compartment.

Two beams protrude out from either side of the carriage, which was tied to the horse harness.

There were no overhead covers for the driver, so they had to wear a poncho when it rains.

Even though the roof of the passenger compartment could serve as a luggage compartment, it was only to the extent of holding leather bags and pouches. The Princess' sword was too heavy, and the roof would probably collapse under its weight.

The station wagons used by commoners didn't have any suspension. The metal chasis was nailed directly onto the base of the carriage.

Station wagons would switch out the horses at relay stations, so it could maintain the speed of about 15km/hr, and could travel 100km in a day. Otherwise, the carriage would only be able to travel half the distance.

In this volume, the carriage prepared by Prince Latreille had suspensions and was known as carriage. Only aristocrats could use them.

The suspension of this era was the leaf spring. A steel plate was fixed to the bottom of the carriage, and the chasis was secured to it. Bumps would thus be absorbed through the bending of the steel plate.

Even though horses had been supporting the flow of cargo for humans for 2000 years, with the invention of the steam engine and combustion engine, they had gradually faded away.

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Class

Ranks were used in the Belgarian Army. Captain General, General, Lieutenant General, Major General, Brigadier General, First Grade, Second Grade, Third Grade, Fourth Grade, Fifth Grade, Sixth Grade, Leading Trooper, Trooper First Class, Trooper.

Strictly speaking, the Emperor who was the Commander-in-Chief (and the Field Marshall who commands in his stead) and recruits who had yet to become official soldiers were not part of the military ranks

The General officers (Captain General, General, Lieutenant General, Major General, Brigadier General) could command a thousand or more troops.

Private armies existed to, but in order to receive command authority by the military, the condition was that the commander had the nobility title of Vicomte and above.

Senior Officers (First Grade, Second Grade, Third Grade) would receive the tasks assigned by the Generals, and would command their subordinates (Junior Officers and Troopers) to perform their mission.

In this volume, Second Grade Combat Officer Abrva eeee was tasked to perform permanent escort mission.

They could also serve as the strategist of Generals like First Grade Admin Officer Germaine.

It was common for commissioned officers to have titles, and if they were commoners, they would be bestowed the title of Chevalier.

In this volume, even though Regis d'Auric was promoted to Third Grade Admin Officer, Prince Latreille didn't have the authority to bestow peerage, so the application had to be raised by the Military Affairs Ministry to the Aristocracy Ministry, and required approval by the Minister… Which would take a lot of time.

Junior Officers (Fourth Grade, Fifth Grade, Sixth Grade) was not permitted to hold long term unsupervised command, and needed to command their subordinates in accordance to the orders of their superior.

Even a veteran commoner could be battlefield promoted to the Sixth Grade if he achieved results, their position overlaps that of non-commissioned officers in the modern army (Sergeants and Corporals).

Officers from the first to sixth grade were divided into frontline combat officers and administrative officers.

As this was an era where 'civil servant = soldier or aristocrat', those working at the counters of government offices and libraries were military admin officers or aristocrats (or their servants).

Men (Leading Trooper, Trooper First Class, Trooper) were commoners, with most of the Troopers being conscripts. They would become proper soldiers if they pass inspection, and there were cases where someone enter with the rank of Trooper First Class.

Their front line authority and equipment didn't differ too much, with their wages being the biggest difference.

Not only do Leading Troopers have their task as a men, they also need to lead their subordinates and train recruits.

Glasses

In Imperial year 851 of the Belgaria Empire, and Steelart Year 42 of High Britannia Kingdom, glasses were a very extravagant object.

According to the ingredient used for the lenses, glasses could be divided into two categories.

Very pure and transparent glass and crystals were hard to obtain, and working them would require special skills.

The technician would need to carve out the item from blocks of the raw material, and spend a large amount of time to grind it carefully. It was then treated like gems and precious metal decorations.

Glasses were invented about 500 years ago. It was used for presbyopia in the beginning, but lenses for short sightedness and astigmatism could be made in this era too.

In terms of design, it could be worn over the ears as it was mostly seen nowadays, it couldn't be worn so steadily as the lenses were too thick. And so, there were glasses attached to handles and glasses with the bare minimal frame.

What Bastian wore were sunglasses made from smoke crystals.

The thing known as crystals were compounds made from silicon and oxygen (crystallization of silicon dioxide), a piece of the quartz that was very pure and transparent. There might be some aluminium in it too.

The oxygen atom bonded together with aluminium loses an electron because of natural occurring radiation, turning into something that would absorb some of the light that pass through it. This thing was known as smoke crystal.

By the way, the smoke in smoke crystals would disappear if it gets heated up. If it undergoes strong radiation, it would become smokey again. Even if the crystal was originally clear, it would become smokey if exposed to strong radiation.

That might be so, but there wasn't any devices that emit radiation in this era, so all this were naturally occurring items.

The frames holding up the lenses were usually made from gold or silver. Not only was it easy to work with, it had a high class feel about it and didn't bend or rust easily.

In order to conceal his crimson eyes which was a feature of Belgarian Royalty, Bastian wore sunglasses made with smoke crystals. But his actions rendered this concealment meaningless… it definitely wasn't because the effect of using sunglasses as a disguise was poor.

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Rifle

High Britannia was the first nation in the world to mass produce rifles.

Back then, muskets were the most common type of firearm, which was prepared by the tedious steps of putting in gunpowder into the barrel, inserting the bullet and pouring gunpowder down the pan before firing.

And since the muskets required the flint to ignite the gunpowder, it had the flaw of being unusable because of foul weather.

Even though paper cartridges that contain both gunpowder and bullet were made to simplify the loading process, it was used mainly for pre emptive and sneak attacks, and couldn't become the main weapon of the battlefield.

The High Britannia's new rifle used centerfire cartridge, and the barrel had rifling grooves, it was a revolutionary type of firearm.

There were primers at the bottom of the metal cartridge, and hitting it with a pin would ignite it. As the entire process happens inside the rifle, it wouldn't be affected by the weather.

The steps for loading a breech loaded rifle was much simpler than a front loaded musket, and it was possible to reload and fire quickly while in a prone position.

Although other nations had also experimented with rifling grooves and breech loading, they lacked durability, uniformity, power, accuracy and were not easy to make, so they couldn't mass produce it.

At the same time — The Belgarian Empire invented the minié ball, and started mass producing front loaded muskets with rifling grooves.

The bullet looked like an acorn with the bottom of it hollowed, the pressure from the explosion would expand the lower part of the bullet. It didn’t matter if it was front loaded or not, the pressure from the explosion wouldn’t leak, and the rifling led to high accuracy.

However, the issue of it being weather dependant and the firing rate remained unsolved.

On another note, the first nation to use breech loaded firearms was the Germanian Federation. They wanted to improve it in secret… But it debut splendidly during a civil war, and its warehouses were broken into shortly after, and the technology spread to other countries.

The complicated designs made it break down frequently, so it wasn’t highly evaluated by the soldiers back then.

With the advancement in firearms, war evolved quickly. In just 20 years, rifles turned from single shot loading to rifle clips. And 30 years after that, the automatic machine guns were invented.

Pain Traditionnel

The staple food of the Belgarian Empire was pain traditionnel, which was bread. Compared to neighbouring nations, the outside of Belgarian bread was hard and would break with a crack, while the inside was as safe as cake.

The reason the bread turned out this way wasn't only because of the traditional baking method, the difference in the main ingredient, wheat, also played a huge part.

The wheat of other nations were hard, while the ones grown by Belgaria were softer. Hard wheat contained more protein, while the softer variant contained less protein.

And gluten was a type of protein that was only found in wheat. That was the source of its elastic and sticky quality, which meant that the softer variant of wheat had less elastic and sticky quality.

The wheat kernel came from the development of the bran, endosperm and germ. The endosperm contained starch and protein, by removing the bran, germ and crushing the endosperm, wheat flour could be extracted.

As flour made from softer wheat contained less gluten, it was called soft flour.

It was hard to bake soft bread with soft flour.

Even though they soft bread could be made by mixing in sugar, eggs or butter… but these were high class items, and it was impractical for commoners to use them daily.

With the theory of adding salt, water and yeast into soft flour would allow them to bake delicious pain traditionnel… The professional bakers are still working on this.

After the yeast ferment into air and steam, the dough would raise as if it was clay, giving the bread its soft texture.

So for soft flour that had less gluten, could they stop the gas and steam from escaping the dough during fermentation to bake delicious bread? If so, how would they seal them in?

When they place the ingredient into the oven, they would inject steam inside it. The exterior would gelatinize, and become dry and hard because of the high temperature inside the oven.

After the exterior hardened, it could seal the gases inside it, allowing the bread to rise.

And in order to not let the exterior crack unevenly during the rising of the bread, the dough would be scored before hand. These were known as coupe after the bread rose, and a large coupe was a sign that fermentation had gone well.

Freshly baked pain traditionnel was very delicious. The citizens of the Empire would queue up in front of bakeries during meal times to buy freshly baked bread.

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Armure

Spears were hunting tools that had been used before the founding of nations. Even though countries of various sizes were founded throughout the Empire and the changes in war tactics, the main weapon of the battlefield were still spears.

In order to protect soldiers from spears, swords and arrows, armour were designed.

The first type of armour was chain mail.

Rings were crafted with thin iron rods, and they were linked into chains. It was called a chain, but it wasn't something thin like ropes, but had the form of a cloth like armour, with each ring linked on all four sides.

At that time, most weapons were made from bronze, and couldn't cut through chain mail, so this armour was very effective.

Although it wasn't widely used in the Belgarian Empire, there were other armours — by sewing tough steel pieces onto leather clothes like the scale of a fish, a scale mail could be made. Lamellar armour, made by stringing pieces of steel plate together with thin ropes, also existed.

With the increase in the Belgarian Empire's cavalry, there was instances of the enemy targeting their legs. To counter this, some of the armour was replaced with plates.

And so, *armure de plaque* came about.

Even though it was light and tough, it had to be made to order in accordance to the body shape of the wearer, and was very expensive. In the beginning, only the aristocrats wore them.

As the nobles rarely head into the front lines even if they went onto the battlefield, early *armure de plaque* were overly decorated, many of them prioritize extravagance over practicality.

With the improvement in steel production, *armure de plaque* that could cover the entire body including the face became mainstream. The armour was very tough, and could even stop spears.

Cheap mass produced armours were also made. After adjusting the length between the parts and stuffing in paddings to fit the body shape, even foot soldiers could wear *armure de plaque.*

And so, people who were more effective with clubs and warhammers appeared on the battlefield.

Shields were used to defend against blunt weapons, and since the enemy attacks were heavy, they countered with speed, leading to the chain mail returning to fashion… And so, the trends come and goes cyclically in this 500 years.

Then came the debut of the rifles.

In the year 851, the Belgarian Empire suffered heavy losses because of High Britannia's breech loaded rifles. With the marked improvement of firearms after this, armour and shields could no longer defend against them.

The main weapon of the battlefield changed from spears to rifles, and the figure of knights in *armure de plaque* disappear with the change in era.

Cuirassé

Using rafts with sails tied to it to fish existed long before human invented writing, so its invention wasn't recorded.

When the Belgarian Empire was founded in the west of the continent, sail ships capable of crossing oceans could already be built.

The ships back then were simple in design, planks laid out in the shape of a boat were secured with horizontal boards, the gaps were filled in with limestone, hemp and resin. The ship might break apart if the waves were too big.

500 years ago, a new technology propagated from the east, which was the use of a thick pillar known as a keel in the center of the ship, which improved the durability of the ship exponentially. Earlier ships were just 50m, and it could now exceed 100m.

Knowledge that formed the fundamentals of cannons arrived at the same time.

The main way of fighting naval wars were to approach an enemy ship, board it and fight on it with melee weapons. In that era, the Belgarian Empire had never lost. Almost the entire fleet had rams in order to crush into enemy vessels.

With the improvement in the performance and mass production of cannons, they could be installed onto the decks and sink enemy vessels before they even get close, so melee tactics shifted towards cannon shoot outs.

Back then, only the upper decks had cannons, and the fleet with vessels of different speed and sizes would fire upon each other as they drew closer, turning it into a chaotic battle.

As High Britannia was an island nation, it's import of tea through commerce resulted in their experience with vessels far exceeding the other countries, and wrote doctrines on naval warfare.

The fleet with uniform firepower and speed would form up in a line, and fire their cannons in unison. As this strategy was very effective, fleets that only place their

cannons on the deck became a thing of the past. That was 200 years ago. Now, the Belgarian Empire and the surrounding nations also mimic High Britannia and mass produced such warships, and it became the era of battleships.

If High Britannia built a 74 gun battleship, the Belgarian Empire would craft a 80 gun battleship, leading to a race in inflating the size and number of guns for battleships. There was even an incident where a battleship sunk when all its guns fired because of the reckless demand of the military to increase the number of guns.

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Soins Médicaux

The medical technology of the Belgaria Empire in Imperial year 851 was much more advanced than the neighbouring states.

The surrounding nations still thought that illness was the malevolence of the devil and used prayers as treatment. If the patient had a fever, his entire body would be dipped into water, if there were wounds, poisonous grass would be stuff in there, and treatment was mostly dependent on religious or traditional remedies.

As cutting off the body part that hurts was the mainstream method of treatment, the ones who were familiar with scissors and performed such surgeries were barbers. There was no concept of sterilization, so the blades weren't heated or disinfected with alcohol before it was used.

In the Empire, doctors were an officially recognized job. Even though surgical and medicinal treatment were still mixed together, they were more widespread than treatment with prayers.

However, it was still a vast gap from modern medical science.

As marijuana was used for anesthesia, some patients became addicted. Blood transfusion used goat's blood, but they didn't know about the existence of blood type and how to stop blood from coagulating, death because of blood transfusion were common.

The existence of microorganism was discovered because of microscopes, but they didn't consider the possibility that germs were the cause of diseases.

In this era, even though the virus of small box that threatened mankind throughout history had not been discovered yet, the disease was being eradicated as vaccines had been developed.

As for the treatment of injuries from swords and arrows, it had not changed since ancient times. White cloth would be used to cover the wounds and stop the blood. It would then be cleaned properly. The rotting parts would be cut off, and the blood stopped. They were basically dependent on the body recovering natural, which was a battle of the patient's endurance.

Doctors in armies had to handle large numbers of wounded at the same time, and they were trained to triage the patients.

Priority would be given to the heavily injured and urgent cases. Or rather, they would judge whether such patients were beyond saving.

The textbook would indicate if a wound to a certain body part or the appearance of a certain colour of liquid would mean the patient was beyond saving.

Most heavy injuries result in death, and they would suffer from sequelae even if they survived. Only a very small handful could make a full recovery.

When war broke out, there would be a large number of death and injuries. In this world, there were no healing magic or items to revive the dead.

Literie

Since the time when man was still living in caves, they started using beddings.

In the beginning, animal skin was laid onto the ground. Some time later, they slept on elevated platform made from wood keep bugs away, and beds appeared.

After pillows started to be used, a headboard was added to stop them from falling off. It was about a thousand years ago when they made beds similar to the modern versions.

In Imperial year 851 of the Belgaria Empire, most beds were wooden crates with straws placed on top of it, and then covering it with a sheet.

Straws trap moisture easily and bugs like lice would infest it easily, so it wasn't really hygienic.

And until a hundred years ago, it was common for many people to sleep on the same bed, and people often slept in the nude. In the motels used by commoners, everyone would sleep together on beds naked, regardless of gender.

That was why beds became a source of spreading disease, and even caused an epidemic.

In this work, Regis and the others lived in the north which was colder, so they slept in clothes. However, ladies like Eleanor from the south was used to sleeping in the nude.

Many aristocrats wore silk pyjamas, and used beds that was stuffed with cotton .

A higher grade would be beds stuffed with feathers. It was expensive, and even nobles would not be able to purchase it easily. If the Emperor was in a good mood, he might gift it to his subjects and those he met during an audience.

High class beds would have canopy. Those were a ceiling supported by four pillars, with curtains draped onto it. Depending on the design, it might look extravagant and

have the function of keeping mosquitoes away. In other words, the canopy was used to repel bugs.

They would build huge bedrooms and place it in the center, away from the cold stone walls.

If the weather was bad, one would need to stay at home for a long period of time. During such times, the bed wasn't just a place to sleep, but also a place to relax.

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Des Aliments Non Périssables

The meals of a normal family would be centered around bread, supplemented by cheese, vegetables. Sometimes, there would be meat. Eggs and fruit was high class product.

The Empire had more than 100,000 soldiers and employ 100,000 workers that support the army, so military supply requires a huge budget.

Most of the supplies were food.

As hard bread won't rot easily, it became the main source of food during war times.

Next would be cheese. After extracting water from milk, the remaining product was very well preserved after it hardens. It would be a bit too hard to eat on its own though.

Other food stuff include dried meat, salted meat and smoked meat. Which was ham and sausages. By the way, meat that been processed for preservation was ham, and meat that looked like intestines were called sausages.

As it was hard to preserve fresh vegetables, a type of pickled cabbage called choucroute would be prepared. It was made by cutting cabbage finely, mixing it with salt and spices before letting it sit in a barrel. The Germanian Federation call this Sauerkraut.

The people of this era didn't know about vitamins yet, but when the soldiers had vitamin deficiencies, they would want to eat vegetables and fruits.

Other ingredients like onions, figs, dried fish and wine would be transported too.

But no matter what method was used, they couldn't preserve it for long periods like modern canned food. For long campaigns, the army would need to source for food on the ground.

Despite the importance of food during war, the supply team won't receive much praise, would not be able to make it big and would be looked down upon.

Sloppy supply planning and pillaging in the name of official requisition often happens during war.

Corset

The slimmer the waist, the more beautiful the lady — Such values began in Imperial Year 700 of the Belgarian Empire (150 years before Altina's story).

Before that, there was time when the upper society starved too, so being plump was a sign of wealth.

With the improvement in grain quality and irrigation, agriculture developed quickly and starvation disappeared, leading to the shift in values. A slender waist was proof that one have not been pregnant, and was charming enough to entice men.

Unlike modern times, the women back then were simply asked to maintain the household, bear children and raise them.

In order to make their waist look slimmer, corsets were invented.

In the beginning, it was made from soft material like the skin of animals and tree barks. But in order to achieve a stronger bind, things like ivory and steel were incorporated. The strings used for tightening was leather ropes like the ones used in steel armour, the structure itself was also crafted by blacksmiths.

Because the binding was too tight, there were people who faint in parties and those who suffer from organs failure. Some time later — with the advent of firearms, death rates in war increases and the women who were only asked to stay at home had to work outside out of necessity.

As the number of jobs women took on increases, the fashion also changes. Unnecessary frills were removed, and clothes became easier to take off, making it easier to move in.

Corsets which was hard to move in and hinder breathing was discarded, warm and fitting underwear that could shape their body and felt comfortable on the skin became popular.

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Lettre

In Imperial year 851 of the Belgaria Empire, paper was expensive, and sealing letters inside envelope was an extravagant behaviour only done by the aristocrats.

The military and merchants would roll letters up, secure it with strings and mail it in tubes.

Few commoners could read, and they wouldn't send mail.

Wax would be used to seal the rolled up letter and string. After dripping wax on it, a seal would be applied before it solidifies.

In order to differentiate the seals between different members of the same House, designs that were similar to the House emblem with slight difference would be used.

As the population increased and literacy improved, the number of posted letters increased dramatically.

The number of cases where the letter was delivered wrongly and the wax seal broke during delivery increased.

Also, the postal service that was handled by the Transport Ministry branched out and became an independent postal office. A new system of fees were implemented.

As postal charges weren't dependant on the number of paper but the weight, heavy waxes fell out of fashion.

Wax were now used in things like wine bottles.

Fabrication de l'acier 1

A long time ago, when the world lacked oxygen, iron was dissolved inside water. With the increase of organism that photosynthesizes, the amount of oxygen in the ocean grew, and the iron in the sea oxidizes and sunk to the seabed.

When the seabed filled with minerals rises up with the earth crustal displacement, it formed iron ore mines.

It was possible to obtain oxidized iron in the form of Magnetite and Hematite from the mines.

The ores contained about 50% impurities as it was a compound of iron and oxygen, so the impurities had to be removed. This was known as refining, and refining iron was smelting.

Smelting in this era was done by using blast furnace.

Iron ores were placed inside the blast furnace, and heated up by using fuel such as charcoal. The combustion of the charcoal will produce Carbon Monoxide (CO), and it would react with Iron Oxide (FO) to produce Iron (Fe) and Carbon Dioxide (CO2).

With advancement in iron processing technology, it's usage became more widespread. The increase in human population further increased the demand for iron, pushing up the production rate too. The harvesting of wood for charcoal gradually depleted the forest.

In place of that, coal was used. Coal could produce higher temperature than charcoal, and was more plentiful than the resources of the forest.

However, coal contained things like sulphur and tar.

If sulphur were mixed in, the iron would become brittle. Tar would evaporate when heated, and block the airway for the furnace.

In order to solve these issues, coke, made by the destructive distillation of coal, was used. However, coke would also result in other problems… (To be continued in the next volume)

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Thé

It had already been mentioned in the 'Cuirassé' section — technology like sailship and cannons came from the east 500 years ago. Back then, they relied mainly on small scale trade by traveling over land.

However, about 200 years ago (When the Belgarian Empire expanded their territory on the strength of their powerful cavalry), with the debut of large sail ships, the various nations started competing on commerce.

The Kingdom of High Britannia which was an island nation was very enthusiastic about trade.

From the west, they exported embroidery, laces and other such cotton product. There were also high class merchandize like clocks, glasses, and precious metals.

From the east, they imported spices, ceramics and most importantly, tea leaves.

There was a widespread belief that tea was good medicine which was effective against all sorts of disease, many aristocrats competed to purchase them.

Tea leaves were kept preciously, and only taken out when hosting important guests.

In this era, the upper class had not drank coffee yet, so the warm and non alcoholic tea was rare and good for the body.

Even in modern Japan, there were scientific studies on the effect of catechin and tannin in slowing aging, prevent disease and food poisoning. It was already known that tea leaves contain vitamins and minerals which were good for health.

During this period, the western nations were making losses in commerce. Even though demand for tea leaves and spices were rising, the things they could export were mostly highly priced and hard to mass produce.

They make payment in silver, and the continuous outflow of silver in cause the domestic price of silver to increase.

The High Britannia parliament was looking into laws to prohibit the outflow of silver.

fabrication de l'acier 2

Digging up iron ore from mines and refining them into iron was known as smelting.

It was explained previously that the fuel used in smelting, coke, was obtained by the destructive distillation of coal.

Destructive distillation was done by cutting off air supply and heating it up. Under normal circumstances, heating up coal would just make it burn, but doing so without oxygen would just distill the impurities. In other words, this was thermal decomposition. And the device used for destructive distillation was called a coke furnace.

It was harder to burn coke, compared to coal. In order to burn them, the temperature of the furnace needed to be increased. The furnace's heat came from burning, also known as combustion, the more oxygen there was, the higher the temperature.

In order to send air into the furnace forcefully, manpower and watermill could no longer suffice. And so, steam generators were starting to be incorporated.

By the way, steam generators were invented in the beginning to expel water from coal mines. Boilers that could withstand high steam pressure couldn't be forged in the beginning, so a lot of the excavated coal was used on the steam generator itself, making it very inefficient.

By civilization was developed by the meshing of countless factors. The used of the steam generator increased the temperature inside the furnace, and large quantity of high grade iron was produced. Boilers that could withstand higher steam pressure was forged from them, and a more efficient steam generator was developed.

With the appearance of high temperature furnace, large quantity of molten iron could be produced, and the lives of the people started changing drastically. Steel farm tools cleared the forest, and farming efficiency improved, increasing the human population by leaps and bounds.

However, there was still some problems with steel made from blast furnace… (To be continued next volume)

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Fusée

When relaying orders to units far away from the battlefield, and notifying the capital of abnormal situation at the national borders during times of peace, speed was of the essence.

The most reliable means were fast horses. They could send information accurately.

However, if the content of the information was simple, simpler methods like pigeons and alarm bells could be used.

On the battlefield, things like bugles could be used.

Signals sent via smoke were called ‘wolf smoke’ in Japanese because the technology was explained as ‘burning the feces of wolves would make the smoke rise up straight’ when it spread from China.

In France, ‘Fusée’ meant smoke signal. It has nothing to do with wolves in europe.

Fusée rises straight up because when the air was heated by flames, it will rise.

A smoke signal structure was build by making a wooden frame, filling it with hay and then burning it.

By throwing in leaves and gunpowder into the fire, the smoke could be dyed a different colour.

As depicted in the illustration, smoke signal structure used in the battlefield just needed to be simple in design.

If it needed to be ready for use for long periods of time, in places like the watch towers at the borders, the design of the smoke signal structure would be more complicated.

In order for it to be usable during rain, roof and chimney would be built. It would have a special design so its flames could be seen in the direction of their allies even at night.

By using a series of fusée, even if the distance required several days of marching, it could be relayed in a few hours.

The invention of the telegraph happened after the development of the railway. And before that, fusée was the fastest mean of relaying information out of all the methods of men.

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